

# DOCTOR OF PHILOSOPHY IN MOLECULAR BIOLOGY

**Web Site:** <https://twu.edu/biology/graduate-programs/doctor-of-philosophy-in-molecular-biology/>

## Degree Requirements

### Total Semester Credit Hours Required

A minimum of 72 semester credit hours, including those at the master's level, and 6 semester credit hours for dissertation.

Code	Title	SCHs
<b>To be fulfilled by every Ph.D. student as early as possible in the program</b>		
BIOL 6513	Molecular Biology	3
BIOL 6334	Advanced Cell Biology	4
BIOL 6734	Advanced Genetics	4
CHEM 5613	Advanced Biochemistry I	3
BIOL 5611	Readings in Biology (taken 3 times)	3
BIOL 5681	Seminar (taken 3 times)	3
Research Tools 1		6-8
Research Tools 2		6
Electives		34
<b>To complete the program</b>		<b>6-18</b>
BIOL 6983	Dissertation (may take twice)	
BIOL 6993	Dissertation (may take 4 times)	
<b>Total SCHs</b>		<b>72-86</b>

## Research Tools

Students must show proficiency in two Research Tools and may select from categories such as Research Methods, Scientific Communication, or Statistics. Other options, such as Bioinformatics, Business, or Grant writing, may be available with approval from the Graduate Advisor and advisory committee.

Code	Title	SCHs
<b>Research Methods</b>		
BACT 6534	Advanced Molecular Techniques I	
BACT 6544	Advanced Molecular Techniques II	
<b>Scientific Communication</b>		
BIOL 5123	Biostatistics	
BIOL 5293	Advanced Scientific Communication	
<b>Statistics</b>		
MATH 5573	Statistical Methods I	
MATH 5583	Statistical Methods II	

## Electives

In addition to the required courses, students may choose elective courses which may include, but are not limited to:

Code	Title	SCHs
BIOL 5033	Advanced Science in the Secondary Classroom	3
BIOL 5293	Advanced Scientific Communication	3

BIOL 5333	Advanced Pathophysiology	3
BIOL 5543	Advanced Genome Editing and Medical Ethics	3
BIOL 5643	Neuroscience	3
BIOL 5663	Biology of Cancer	3
BIOL 5503	Research Methods	3
BIOL 5611	Readings in Biology	1
BIOL 5613	Readings in Biology	3
BIOL 5801	Biological Research	1
BIOL 5803	Biological Research	3
BIOL 5881	Biological Research	1
BIOL 5883	Biological Research	3
BIOL 5901	Special Topics (*)	1
BIOL 5903	Special Topics (*)	3
BIOL 5911	Independent Study	1
BIOL 5913	Independent Study	3
BIOL 5973	Professional Paper	3
BIOL 6843	Health Care Genetics	3
BIOL 6821	Research in Molecular Biology	1
BIOL 6823	Research in Molecular Biology	3
BIOL 6831	Research in Molecular Biology	1
BIOL 6833	Research in Molecular Biology	3
BIOL 6911	Independent Study	1
BIOL 6913	Independent Study	3
CHEM 5623	Advanced Biochemistry II	3

\*Special Topics courses cover emerging issues or specialized content not represented in the main curriculum. Past special topics have included: Bioinformatics, Cancer Biology, Electron Microscopy, Genetics, Genome Editing, Immunology, Neuroscience, and Signal Transduction.

## Dissertation

6 to 18 dissertation hours

## Qualifying Examination

The qualifying examination consists of two parts: a written research proposal (the Prospectus) and an oral examination covering the contents of the proposal and general knowledge in the fields of molecular biology. The student must complete all required coursework and research tools prior to the Qualifying examination, which is administered by the student's advisory committee.

## Final Examination

A public seminar in which the student shares the research results, followed by an oral examination by the advisory committee, is required.